

Title: TRANSPORT AND EXCHANGE OF FLORIDA BAY INTERIOR WATERS.

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Project Summary: A two-year study is proposed to determine the transport and exchange between Florida Bay and the surrounding waters of the Gulf of Mexico and the Atlantic Ocean. The research will be a new joint effort between the University of Miami (UM), NOAA's Atlantic Oceanographic and Meteorological Laboratory (NOAA/AOML), the U.S. Geological Survey (USGS), and Harbor Branch Oceanographic Institute (HBOI) to simultaneously measure and resolve the net exchanges of water volume and salt between the interior of Florida Bay and the connecting waters of the Gulf of Mexico and the Atlantic Ocean. This project will be conducted through CIMAS, Task 3, Theme 3: Coastal Ecosystem Processes, and builds upon the experience gained by each of the proposal partners from previous SFP and other funded studies. This previous work has provided an improved level of understanding of inner basin transport mechanisms and residence times. However, the size and complexity of Florida Bay's western region and eastern Keys boundary demand a much larger effort to reach a similar level of understanding and quantification of transports for the Bay as a whole than any single research organization can provide. Therefore, for SFP 2004 we are proposing a joint study that will focus the measurement capabilities of UM, NOAA/AOML, USGS, and HBOI on a year long coordinated effort to resolve the net transports between Florida Bay and the surrounding oceanic waters of the Gulf of Mexico and Atlantic Ocean on hourly to annual time scales. Combining the net channel transports with interior Bay volume changes and evaporation,

precipitation and river discharge data from other ongoing programs will provide the first estimates of the net flows over the shallow western banks, and reduce the uncertainty of ground water inputs. Resolving transport time series, water and salt balances, and residence times will provide critical tests for evaluation of the Florida Bay circulation model. The results will also be important for understanding the impacts of Everglades restoration activities and future changes in water delivery and their possible downstream influences on water quality in Florida Bay and the Florida Keys National Marine Sanctuary (FKNMS).

This proposed investigation is also highly integrated with companion SFP 2004 proposals by P. Ortner et al. for long-term measurements of circulation and water mass variability in South Florida coastal waters, and E. Johns et al. for real-time transport and water quality studies in the Middle Keys as well as the monitoring efforts of Everglades National Park and Florida International University. The study is tightly coordinated with other planned SFP 2004 investigations to help understand nutrient cycles and persistent algal blooms, recruitment pathways, and mechanisms that regulated water quality and transport to the FKNMS coral reefs.

Relevance to
Restoration and/or
Resource
Management:

Major uncertainties still remain as to the quantity, pattern and variability of volume and salt exchange between Florida Bay's interior waters and the surrounding waters of the Gulf of Mexico and Atlantic Ocean. Quantifying these exchange rates and patterns will provide an improved understanding of the Bay's flushing properties and a critical data set for model calibration and validation, both of which are necessary to assess the effects of upstream restoration activities.

Geographic Area:

Florida Bay interior.